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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/537,900

12/29/2005

Mark Kenneth Jablonski

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GREENLEE WINNER AND SULLIVAN P C
4875 PEARL EAST CIRCLE
SUITE 200
BOULDER, CO 80301

EXAMINER

NGUYEN, DUNG T

ART UNIT

PAPER NUMBER

2828

MAIL DATE

DELIVERY MODE

05/25/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/537,900

Applicant(s)

JABLONSKI ET AL.

Examiner

Dung (Michael) T. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 April 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6, 11, 13, 14, 17, 18, 20, 22-24, 26, 28-30, 32, 34-37, 41 and 47-54 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 11, 13, 14, 18, 20, 22-24, 26, 28-30, 32, 34-37, 41 and 47-54 is/are rejected.
- 7) ☒ Claim(s) 17 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

The indicated allowed claims 22 and 34 are withdrawn due to the new ground of rejection.

Claim Objections

Claim 51 is objected to because of the following informalities: nanotubes should be corrected. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 26, 28-30, 32, 34-37, 41, 50, 52, and 54 are rejected under 35 U.S.C. 102(e) as being anticipated by Sakaibara et al. (2005/0069669).

With respect to claims 26, 28, 34, 37, 41, and 52, Fig.5 shows a pulsed laser (para.0093) mode locking element comprising one or more layers containing carbon nanotubes (SWNTs) 11 (it is understood that carbon nanotubes are used for the saturable absorption function (saturable absorber) and therefore the laser is mode locked as well known in the art and also as pointed out in the abstract of this instant application); wherein the carbon nanotubes are provided in a layer

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the thickness of which is varied to adjust the mode-locking and/or Q-switching threshold optical energy (para.0022-0023).

With respect to claims 29-30, para.0022 discloses the carbon nanotubes are selected to have a range of different diameters to provide a wide operating bandwidth.

With respect to claim 32, para.0070 and 0075 disclose the carbon nanotubes are capable of operation in both reflection and transmission mode.

With respect to claim 35, Fig.5 shows a layer of carbon nanotubes 11 is provided on a substrate surface 12.

With respect to claim 36, Fig.6 shows the other face of the substrate 12 is provided with a half mirror 14.

With respect to claim 50, Fig.5 shows carbon nanotubes 11 are in the waveguide (light passed through).

With respect to claim 54, para.0086 discloses a femtosecond laser.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-6, 11, 13-14, 18, 20, 22-24, 47-48, and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Scheps (6539041) in view of Sakaibara et al. (2005/0069669).

With respect to claims 1, 3, 18, 22, 47-48, and 53, Scheps shows in fig.1 a laser for generating light pulses at a selected operating wavelength or range of wavelengths and a selected fundamental repetition frequency comprising:

(a) one or more optical resonators 150, 154 or a closed optical path where a light pulse can build up over multiple round trips; wherein the one or more resonators or the closed optical path comprises one or more gain mediums 106, 118 and wherein the round trip path length is selected to give the selected fundamental repetition frequency;

(b) one or more pump light sources 102;

(c) one or more optical couplers (col.2, l.1-3) for coupling pump light from the pump light source into the one or more gain mediums to provide optical gain at the selected operating wavelength or range of wavelengths;

(d) one or more nonlinear optical or saturable absorber elements 110 (col.2, l.18-21) or devices optically coupled with the one or more optical resonators or the closed optical path and

(e) one or more optical couplers 112, 126 for coupling light pulses out of the laser.

Scheps lacks one or more of the saturable absorber comprises carbon nanotubes.

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Sakaibara et al. teach one or more of the saturable absorber comprises carbon nanotubes in fig.5-6 and para.0009.

it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide Scheps what is taught by Sakaibara et al. to have a high saturable absorption function (para.0021) with extremely low cost and efficiency (para.0108).

With respect to claims 2 and 4, Scheps discloses in fig.1 a wavelength tuning element 122.

With respect to claim 5, it is understood that carbon nanotubes are used for the saturable absorption function (saturable absorber) and therefore the laser is mode locked as admitted in the disclosure of this instant application on page 2).

With respect to claim 6, Sakaibara et al. disclose in para.0093 the mode locker is an optical pulse-initiating, self starting element.

With respect to claims 11 and 13, Scheps discloses in col.2, l.18-21 a Q-switch cooperated with the saturable absorber.

With respect to claim 14, Sakaibara et al. disclose in para.0093 optical pulses of length less than 1 picosecond.

With respect to claim 20, Sakaibara et al. disclose in para.0088 the carbon nanotubes are provided in a layer less than or equal to about 10 microns in thickness.

With respect to claim 23, Sakaibara et al. disclose in para.0064 the carbon nanotubes comprise 50% or more by weight of semiconductor carbon nanotubes.

With respect to claim 24, Sakaibara et al. disclose in para.0022 the diameters of the carbon nanotubes are selected to exhibit an exciton absorption in the operating wavelength range of the laser.

Claims 49 and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Scheps (6539041) in view of Sakaibara et al. (2005/0069669) and further in view of Risch et al. (20040109652). Scheps (6539041) and Sakaibara et al. (2005/0069669) disclose all limitations of the claims except for the carbon nanotubes are optical fiber.

Risch et al. teach the carbon nanotubes are optical fiber (Abstract).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide Scheps and Sakaibara et al. to save cost and protect the fiber from the possible attenuation of the signal transmitted (para.0015-0016).

Response to Arguments

Applicant's arguments filed on 04/02/07 have been fully considered but they are not persuasive.

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On pages 10-12, Applicants argued that Sakaibara does not teach a laser mode-locking element containing carbon nanotubes to generate laser pulses. The examiner does not concur.

Indeed, Sakaibara do disclose in Fig.5 and para.0083-0093 a laser mode-locking element containing carbon nanotubes to generate laser pulses and the above rejection would explain why the claimed limitations are met.

Allowable Subject Matter

Claim 17 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Communication Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dung (Michael) T Nguyen whose telephone number is (571) 272-1949. The examiner can normally be reached on 8:30 - 17:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Min Harvey can be reached on (571) 272-1835. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-3329.



Michael Dung Nguyen

5/10/07